

### **REMARKS**

This communication is a full and timely response to the non-final Office Action dated September 28, 2005 (Paper No./Mail Date 20050923). By this communication, claims 1-7, 14, and 15 have been canceled without prejudice or disclaimer of the underlying subject matter. Moreover, claims 8-13 have been amended, and claims 16-22 have been added.

Claim 8 has been placed into independent form. No new matter has been added.

Each of claims 11 and 12 have been amended to recite judging the consistency in terms of the local structure of the new pixel interpolated by said interpolation means performing linear interpolation to generate a second new pixel from two pixels lying along the detected direction of the edge when the consistency judging determines that a value obtained by multiplying a first difference and a second difference is negative; subtracting the new pixel value from the pixel value of a pixel located at the center of the upper row to obtain the first difference; and subtracting the pixel value of a pixel located at the center of the lower row from the new pixel value to obtain the second difference. Support for the subject matter added to claims 11 and 12 can be found, variously throughout the specification and claims, for example, in original claim 8. No new matter has been added.

Claims 9, 10, and 13 have been amended to address dependency matters due to the amended base claim, where applicable. No new matter has been added.

Claims 16-22 have been added. Support for the subject matter recited in claims 16-22 can be found variously throughout the specification and claims, for example, in original claims 2-7 and 14, respectively. No new matter has been added.

Claims 8-13 and 16-22 are pending where claim 8 is independent.

### **Allowable Subject Matter**

Applicant appreciates the Office Action indicating the presence of allowable subject matter in claim 8. As discussed above and in further detail below, claim 8 has been placed into independent form. Accordingly, Applicant submits that claim 8 and all depending claims are in condition for allowance.

### **Rejections Under 35 U.S.C. §102**

Claims 1, 5-7, 11, and 12 were rejected under 35 U.S.C. §102(e) as anticipated by *Aoyama et al.*—U.S. Patent No. 6,535,651. Applicant respectfully traverses this rejection.

As discussed above, claims 1 and 5-7 have been canceled without prejudice. Thus, the rejection of these claims is moot and should be withdrawn.

Claim 11 recites image processing method of converting the resolution of an original image in such a manner as to increase the spatial resolution of said original image by a factor of  $Z$  in each of vertical and horizontal directions, said image processing method comprising the steps of calculating local energy of said original image based on two rows of pixels in said original image; detecting the direction of an edge based on said local energy calculated in said energy calculating step; interpolating a new pixel from a pixel of said original image based on the direction of the edge detected in said detection step; performing an edge enhancement process based on said local energy calculated in said energy calculating step; judging the consistency in terms of the local structure of the new pixel interpolated by said interpolation means; performing linear interpolation to generate a second new pixel from two pixels lying along the detected direction of the edge when the consistency judging determines that a value obtained by multiplying a first difference and a second difference is negative; subtracting the new pixel value from the pixel value of a pixel located at the center of the upper row to obtain the first difference; and subtracting the pixel value of a pixel located at the center of the lower row from the new pixel value to obtain the second difference.

Claim 12 recites a storage medium storing a computer-readable program for controlling an image processing apparatus to convert the resolution of an original image in such a manner as to increase the spatial resolution of said original image by a factor of  $Z$  in each of vertical and horizontal directions, said program comprising the steps of calculating local energy of said original image based on two rows of pixels in said original image; detecting the direction of an edge based on said local energy calculated in said energy calculating step; interpolating a new pixel from a pixel of said original image based on the direction of the edge detected in said detection step; performing an edge enhancement process based on said local energy calculated in said energy calculating step; judging the consistency in terms of the local structure of the new pixel interpolated by said interpolation means; performing linear interpolation to generate a second new pixel from two pixels lying along the detected direction of the edge when the consistency judging determines that a value obtained by multiplying a first difference and a second difference is negative; subtracting the new pixel value from the pixel value of a pixel located at the center of the upper row to obtain the first difference; and subtracting the pixel

value of a pixel located at the center of the lower row from the new pixel value to obtain the second difference.

In summary, each of claims 11 and 12 recite judging the consistency in terms of the local structure of the new pixel interpolated by said interpolation means performing linear interpolation to generate a second new pixel from two pixels lying along the detected direction of the edge when the consistency judging determines that a value obtained by multiplying a first difference and a second difference is negative; subtracting the new pixel value from the pixel value of a pixel located at the center of the upper row to obtain the first difference; and subtracting the pixel value of a pixel located at the center of the lower row from the new pixel value to obtain the second difference. Because the aforementioned subject matter was originally recited in claim 8 and identified by the Office Action as allowable, Applicant respectfully submits that claims 11 and 12 are allowable. Accordingly, Applicant respectfully requests that the rejection of claims 11 and 12 under 35 U.S.C. §102 be withdrawn, and these claims be allowed.

#### **Rejections Under 35 U.S.C. §103**

Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as unpatentable over *Aoyama* and further in view of *Klassen*—U.S. Patent No. 6,741,751. Applicant respectfully traverses this rejection. However, in an effort to expedite prosecution claims 2 and 3 have been canceled without prejudice. Accordingly, Applicant respectfully requests that the rejection to claims 2 and 3 under §103 be withdrawn.

Claims 4 and 14 were rejected under 35 U.S.C. §103(a) as unpatentable over *Aoyama* and further in view of *Moronaga et al.*—U.S. Patent No. 5,229,864. Applicant respectfully traverses this rejection. However, in an effort to expedite prosecution claims 4 and 14 have been canceled without prejudice. Accordingly, Applicant respectfully requests that the rejection to claims 4 and 14 under §103 be withdrawn.

Claims 9, 13, and 15 were rejected under 35 U.S.C. §103(a) as unpatentable over *Aoyama* and further in view of *Ng et al.*—U.S. Patent No. 5,450,531—and *Russ*—The Image Processing Handbook, 1995. Applicant respectfully traverses this rejection. However, in an effort to expedite prosecution, claim 14 has been canceled without prejudice and claims 9 and 13 have been amended to depend from claim 8. By virtue of this dependency, Applicant

respectfully submits that claims 9 and 13 are allowable for at least the same reasons given above with respect to claim 8. In addition, Applicant submits that claims 9 and 13 are further distinguished over *Aoyama* and *Ng* by the additional elements recited therein, and particularly with respect to each claimed combination. Applicant respectfully requests, therefore, that the rejection of claims 9 and 13 under 35 U.S.C. §103 be withdrawn, and these claims be allowed.

**Newly Added Claims**

Claims 16-22 have been added. Each of claims 16-22 depends either directly or indirectly from claim 8. By virtue of this dependency, Applicant respectfully submits that claims 16-22 are allowable for at least the same reasons given above with respect to claim 8. Accordingly, Applicant respectfully requests that claims 16-22 be considered and allowed.

**Conclusion**

Based on at least the foregoing amendments and remarks, Applicant submits that claims 8-13 and 16-22 are allowable, and this application is in condition for allowance. Accordingly, Applicant requests a favorable examination and consideration of the instant application. In the event the instant application can be placed in even better form, Applicant requests that the undersigned attorney be contacted at the number listed below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. SON-2199 from which the undersigned is authorized to draw.

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Respectfully submitted,

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